

REMARKS/ARGUMENTS

Entry of the amendment and reconsideration is respectfully requested of the Office Action of July 10, 2009 relating to the above identified application. Entry of the amendment would reduce the number of issues on appeal, respond to a rejection included for the first time in the Final Office Action and does not introduce new matter. The amendment to claims 14 and 23, changing the “filler” to silver powder, which is amply supported in the paragraph bridging pages 14 and 15 of the specification and the examples. The additional amendment to claim 23 corrects an obvious oversight and is responsive a rejection raised in the Final rejection. Support for the change as to X² can be found on page 19 starting at the first line from the bottom and continuing on to page 20, the third line and the examples.

The claims in the case are Claims 1 to 41.

Claims 1-13, 15-22 and 26-41 are withdrawn.

The withdrawal of the rejection based on Dershem et al. ('194) or Dershem et al. ('195) is noted with appreciation.

The objections to the claims relating to MPEP 714(II) (C) have been addressed in the manner suggested by the Examiner.

The role of components (A), (B), (C), (D) and (G) of claim 14 and claim 23 compositions

Briefly summarized, claim 14 is drawn to a thermosetting resin composition comprising a silver powder filler (A), compound (B), thermal radical initiator (C) and compound (D), and substantially not containing a photo polymerization initiator. Claim 23 is drawn to a thermosetting resin composition comprising a silver powder filler (A), compound (B), thermal radical initiator (C) an allyl ester compound (G), and substantially not containing a photo polymerization initiator. The thermosetting resin composition is used as a die attach adhesive material for semiconductors or as an adhesive material for bonding a heat dissipating member.

Compound (B) is a bismaleimide compound (B') which has a structure represented by the formula (3) where X² is now limited to -O-. A maleimide group or a derivative thereof contained in the bis-maleimide compound (B') shows, by the action of the thermal radical initiator (C) used in combination, good cross-linking reactivity when heated. Also, because of the

polarity of the maleimide group or derivative thereof in the bis-maleimide compound (B'), the resin composition shows good adhesion to hard-to-adhere-to metal surfaces such as silver plating and Ni-Pd plating. In addition, because the bis-maleimide compound (B') has two or more functional groups, it is effective in sufficiently increasing the adhesion of the resin composition and preventing the resin composition from having a high viscosity. Further, because the bis-maleimide compound (B') is liquid at room temperature, it is not necessary to use a solvent, and even in the case of diluting the compound, it can be diluted with a general liquid vinyl compound. By using the bis-maleimide compound (B') in a liquid state, it is possible to prevent a deterioration in the thermal conductivity of a cured product of the resin composition due to the use of a polar solvent. Further, the cured product of the resin composition exhibits flexibility and has excellent low stress properties.

These resin compositions of claims 14 and 23 are used as die attach material for semiconductors or as material for bonding a heat dissipating member. From the viewpoint of thermal management in semiconductors, the silver powder (A) provides high thermal conductivity which ensures heat dissipating performance.

The compound (D) is a compound containing a structure represented by formula (4) in a main chain and having at least one functional group which has a polymerizable C-C unsaturated bond. Compound (D) promotes in the cured product of the resin composition adhesion in water treatment conditions or adhesion to an easily oxidized metal surface such as copper. The presence of O, COO and OC₂O in compound provides for flexibility (low stress) and adhesion.

The allyl ester compound (G) contained in the resin composition of claim 23 is a compound which contains an allyl ester structure represented by the formula (8). By incorporating the allyl ester compound (G) in the thermosetting resin compositions of the present invention, the cured product obtained by thermal curing is provided with excellent balance between adhesion and low stress properties.

Claims 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully traverse in light of the amendments to claim 23.

In light of the amendments, withdrawal of the rejection is respectfully requested.

Claims 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete. Applicants respectfully traverse in light of the amendments to claim 23.

In light of the amendments, withdrawal of the rejection is respectfully requested.

Claims 14 and 23-25 are rejected under 35 U.S.C. 102(b) as anticipated by *Uchida et al.*, JP 04-159315. Applicants respectfully traverse.

For a reference to be anticipatory, it must teach each and every element required by the claims.

The claims as amended require that the filler be a silver powder and that the bis-maleimide have a structure depicted as formula (3) where X² is -O-.

As described in the Office Action, Uchida does not teach a silver powder filler nor does it teach a maleimide like that claimed (compound B'). The Uchida et al. fillers taught are glass and carbon fibers.

Accordingly, withdrawal of the rejection is respectfully requested.

Claims 14 and 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Herr et al (US 6,265,530). Applicants respectfully traverse.

For a reference to be anticipatory, it must teach each and every element required by the claims.

The claims as amended require that the filler be a silver powder and that the bis-maleimide have a structure depicted as formula (3) where X² is -O-. The claims also require the presence of compound (D) and claim 23 additionally requires the presence of compound (G).

Herr et al. fail to teach any of compounds (B'), (D) and (G).

The Office Action suggests that the formula [M-X_m]_n-Q corresponds to the compound (B') when m=0, n=2 and Q is an ester of R³-C(O)-O-R³-O-C(O)-R³. In this formula however, R³ is an alkyl or alkyloxy chain having 100 atoms or less so that the polyether chain $[-(R-O)]_n$ is excluded. Therefore, the claimed bismaleimide compound is not described in Herr et al.

Herr et al. also does not teach either compound (D) or allyl ester compound (G) for the reasons that follow.

To be an allyl ester compound (G) as claimed, the vinyl compound represented by $\{R^1-CH=CR^2-B-X_m\}_n-Q$ (wherein $R^1=R^2=H$, $m=0$ and $B=C$) disclosed in Herr et al. is required to be such that $Q=O-C(O)-Q'$, i.e. $[B-Q]=[B-O-C(O)-Q']$. In the case of $Q=-R^3-C(O)-O-R^3-O-C(O)-R^3$, however, one of the terminals of Q (the connecting site to B) is R^3 , and R^3 is an alkyl or alkyloxy chain. Therefore, the vinyl compound cannot be the allyl ester compound (G) of the present invention. Even in the case where $B=C(O)$ or O, it cannot be allyl ester compound (G).

On the other hand, to be compound (D) of the present invention, the vinyl compound represented by $\{R^1-CH=CR^2-B-X_m\}_n-Q$ (wherein $R^1=R^2=H$, $m=0$ and $B=C$) disclosed in Herr et al. is required to be such that Q includes $-(O-R^7)-$, $-(-COO-R^7)-$ or $-(-OCOO-R^7)-$. In the case of $Q=R^3-C(O)-OR^3-C(O)-R^3$ (wherein R^3 is an alkyl or alkyloxy chain), the vinyl compound cannot be compound (D) of the present invention. Even in the case where $B=C(O)$ or O, it cannot be compound (D) of the present invention.

Accordingly, withdrawal of the rejection is respectfully requested.

Claims 24 and 25 are rejected as unpatentable under 35 U.S.C. 103(a) over *Uchida et al.*, JP 04-159315. Applicants respectfully traverse.

The deficiencies of Uchida et al are discussed above. A change in the statutory basis for the rejection does not remedy the deficiencies. Teachings are required.

Also, the previously submitted Rule 132 Declaration by two of the co-inventors named in this application should be considered either in the context of rebutting a prima facie case or in considering the propriety of the prima facie case. The unexpected advantages of the invention are clearly seen. (The specification also demonstrates advantages which should be again considered.) The additional evidence contained in the Declaration concerns a comparison of Examples E1, E2 and E3 with Comparative Example E1 and the additional Comparative Example E'. Comparative Example E1 contained no Compound B and Additional Comparative Example E' contained no allyl ester G. As can be readily seen from the test results regarding adhesion, warpage and reflow resistance, the Additional Comparative Example E' exhibited poor warpage and reflow resistance characteristics.

Withdrawal of the rejection is respectfully requested since a prima facie case has not been established due to the absence of essential teachings.

Claims 14 and 23-25 are rejected as unpatentable under 35 U.S.C. 103(a) over Herr et al.

The deficiencies of Herr et al. are noted above. The change in the statutory basis does not remedy the situation unless teachings are provided.

As above, weight should be given to the previously submitted Rule 132 Declaration.

A proper prima facie case has not been established. Withdrawal of the rejection is respectfully requested.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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